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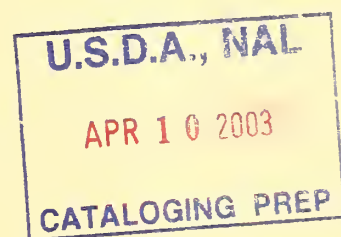
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FARM ANIMAL WELL-BEING ISSUES REPORT

Presented to:
USDA Farm Animal Well-Being Task Group
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**United States
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Agriculture**



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EXECUTIVE SUMMARY

A primary goal of the U.S. Department of Agriculture (USDA) is to ensure a safe, stable and adequate supply of quality animal products from a viable animal agriculture that uses environmentally sound management practices and proper stewardship of farm animals. Public issues and concerns associated with farm animal well-being are complex and value-based. USDA recognizes these values and the importance of science-based information for objective analysis and resolution of these issues and concerns.

This report summarizes USDA Agencies' authorities and activities in farm animal well-being and provides comments on the report by Dr. Temple Grandin on the "Survey of Stunning and Handling in Federally Inspected Beef, Veal, Pork, and Sheep Slaughter Plants" funded by the USDA Farm Animal Well-Being Task Group in 1996. USDA accepts her report as a credible resource, which should be utilized by industry and USDA for decision-making and actions.

USDA's approaches for addressing farm animal well-being issues include supporting: 1) research; 2) education and training; 3) development and implementation of industry standards for farm animal care, handling, transport and slaughter; and 4) regulation where appropriate under existing authorities. Various USDA agencies share responsibilities in these areas. The existing authorities for farm animal regulation by USDA are the Humane Slaughter Act, the Packers and Stockyards Act, Horse Protection Act, and in some instances, the Animal Welfare Act. The USDA Farm Animal Well-Being Task Group and its Working Group provide important coordination among all Agencies for continued progress. In general, USDA supports industry self-regulation of farm animal well-being standards. USDA should work in concert with industry standards whenever effective, but where animal welfare problems continue to exist in areas covered by legislative authorities, appropriate USDA oversight should be applied.

Opportunities for USDA actions to enhance farm animal well-being include programs and activities such as: 1) developing and sponsoring national forums and other cooperative animal well-being activities; 2) enlarging the role of AWIC/NAL as a primary repository for farm animal well-being information; 3) sponsoring high priority research to fill current knowledge gaps; and 4) encouraging the education and training of all stakeholders on animal well-being.

Specific suggestions are noted related to deficiencies cited in the Grandin Report. Most of the problem areas in her report are already covered, at least in part, by existing FSIS regulations related to the Humane Slaughter Act. USDA should promote industry adoption of her critical objective criteria for stunning efficiency, insensibility of stunned animals on the bleeding rail, vocalization of cattle and pigs, electric prod use, slipping in the stunning-chute area, and falling down. Specific USDA actions were recommended for training and supervision of slaughter plant personnel, maintaining and using electric prods and stun guns, using objective criteria for evaluating animal well-being, maintaining non-slip floors, and transporting and handling non-ambulatory (downer) animals.

FARM ANIMAL WELL-BEING ISSUES REPORT

I. Introduction

Animal products make a considerable contribution to human diets in the U.S. In a October 1997 report entitled "Contribution of Animal Products to Healthful Diets" from the *Council for Agricultural Science and Technology (CAST)*, the following overview was given:

"Foods derived from animals contribute significantly to total nutrients in the U.S. food supply. Moreover, the availability to humans of the nutrients in animal products is high, often exceeding the availability for the same nutrients, e.g., calcium and phosphorous, in foods derived from plants. Animal-derived foods are a primary source of cobalamin (vitamin B12), and pyridoxine (vitamin B6), riboflavin, niacin, zinc, phosphorus, and calcium for the U.S. population. Nearly 70% of dietary protein and nearly 40% of dietary calories are of animal origin. Between 30 and 40% of dietary thiamin, vitamin A, iron, and magnesium is of animal origin."

No doubt, animal products will remain as important sources of nutrients in the future. A primary goal of the U.S. Department of Agriculture is to ensure a safe, stable and adequate supply of quality animal products from a viable animal agriculture that uses environmentally sound management practices and proper stewardship of farm animals.

The actions of interested parties outside government are integral to achieving the above goal. There are public concerns about the ethics of animal usage for human purposes (including research and food production), the humaneness of modern animal production practices and systems, and the handling of farm animals during their collection, transport and slaughter for food. These issues are complex, and their resolution must include consideration of several factors related to farm animal care and use, including issues of economics, food safety, food security, human nutrition, human health, legal and regulatory concerns, and science.

Objective analysis of these issues is needed, and science based information should be used to the extent available. In another September 1997 *CAST* report entitled "The Well-Being of Agricultural Animals," the following recommendations were made regarding the scientific assessment of farm animal well-being:

- Producers should continue to adopt scientifically based practices.
- Voluntary animal-care guidelines published by most producer organizations have been based on scientific assessment of husbandry practices and should be consulted.
- Education of the general citizenry should be based on scientific assessment of animal well-being.



- The Congress of the United States should continue to consider scientific assessment and opinion seriously when addressing specific issues.
- The public should consider requesting scientific assessments of (1) the actual need to alleviate animal suffering and (2) the degree to which proposed alternative practices would alleviate any suffering.
- Future designs of animal accommodations and practices should reflect the results of scientific assessment.

These recommendations appear to be germane to the programmatic activities of USDA. Furthermore, the interests and needs of food animal producers and processors, the scientific community, consumers of animal products and other stakeholders should be recognized and appropriately balanced within the USDA policies and programs for the humane treatment and slaughter of farm animals.

This report was developed at the request of the USDA Farm Animal Well-Being Task Group, a body of USDA officials from Agencies with animal related responsibilities and programs. It was developed to give a general overview of agency programs within USDA that contribute directly and indirectly to farm animal welfare/well-being and to explain the important legislative authorities under which these agencies operate. In addition, the Dr. Temple Grandin Report and USDA programmatic responses are discussed along with opportunities for future programs and activities. This report is intended to focus on the handling and slaughter of livestock, but USDA recognizes the importance of other farm animal well-being issues that are beyond the scope of the report.

II. Animal Well-Being Programs within USDA

A number of USDA agencies have programs that relate to animal well-being, including farm animal well-being issues. A brief description of the activities of agencies, which have major program responsibilities in animal areas, is given below.

A. Animal and Plant Health Inspection Service (APHIS)

The APHIS mission is to respond to issues involving animal and plant health, conflicts with wildlife, environmental stewardship, and animal well-being. The Agency promotes the health of animal and plant resources nationwide to facilitate their movement in the global marketplace and to ensure abundant agricultural products and services for U.S. consumers.

Historically, this Agency has played a major regulatory role and serves as a focal point within USDA on issues related to animal well-being. Current authorities involve the development of regulations and enforcement responsibilities for the Animal Welfare Act, Horse Protection Act, and Slaughter Horse Proposed Rules (1996 Farm Bill). The



Animal Welfare Act regulations apply to farm animals used for nonagricultural research and exhibition, and for horses used for nonagricultural research. Farm animals raised for food and fiber products are not covered. Under the Horse Protection Act, the showing, sale, auction, exhibition, or transport of sore shod horses is prohibited. Proposed regulations for slaughterhouse transport to ensure humane standards for the transportation of horses to slaughter were published in the Federal Register on May 19, 1999.

A livestock disease prevention and control function exists to exclude communicable diseases through prevention and eradication programs. By participating in cooperative and partnership initiatives, the Agency supports industry programs, which promote animal well-being through humane practices. Broad program areas related to farm animals are summarized below.

Excluding Foreign Pests and Diseases. APHIS safeguards the U.S. borders against the entry of foreign agricultural pests and diseases at airport terminals, seaports, and border stations. APHIS is responsible for enforcing regulations governing the import and export of plants and animals and certain agricultural products. While many of these activities relate to plants, the importation of animal products as well as live animals are monitored and regulated. Animal disease organisms may survive processing in meat products or meat scraps from foreign sources and represent a hazard for the U.S. animal industries. Live animals are quarantined at import centers to ensure that they are not infected with foreign diseases or infested with exotic pests. For example, APHIS officials are actively working to prevent the entry of bovine spongiform encephalopathy, sometimes referred to as "mad cow disease."

Domestic Animal Health Programs. In domestic activities, APHIS monitors the U.S. in search of foreign agricultural pests and diseases, and takes emergency actions if foreign pests or diseases have passed through border defenses. Other contributions to animal health include fighting selected domestic animal diseases and ensuring that veterinary biologics are safe, pure, potent and effective. Protecting the health of the Nation's livestock and poultry industries is the responsibility of the Veterinary Services (VS) section of APHIS. VS veterinary medical officers and animal health technicians work with their counterparts in the States and with livestock producers to carry out cooperative programs to control and eradicate certain animal diseases.

Disease control and eradication measures include quarantines to stop the movement of possibly infected or exposed animals; testing and examination to detect infection; destruction of infected (sometimes exposed) animals to prevent further disease spread; treatment to eliminate parasites; vaccination in some cases; and cleaning and disinfection of contaminated premises.

APHIS animal health programs are carried out by a field force of about 250 veterinarians and 360 lay inspectors working out of area offices (usually located in State capitals).

Laboratory support for these programs is supplied by APHIS' National Veterinary Services Laboratories (NVSL) at Ames, Iowa, and Plum Island, N.Y., which are centers of excellence in the diagnostic sciences and an integral part of the animal health programs of APHIS.

Under the Virus-Serum-Toxin Act of 1913, APHIS enforces regulations to assure that animal vaccines and other veterinary biologics are safe, pure, potent, and effective. Veterinary biologics are products designed to diagnose, prevent, or treat animal diseases. They are used to protect or diagnose disease in a variety of domestic animals, including farm animals, household pets, poultry, fish, and fur bearers. In contrast to animal medicines, drugs, or chemicals, which are regulated by the U.S. Food and Drug Administration, veterinary biologics are derivatives of living organisms. Veterinarians and other professionals in the APHIS VS Center for Veterinary Biologics regulate and license all veterinary biologics as well as the facilities where they are produced. They also inspect and monitor the production of veterinary biologics, including both genetically engineered products and products produced by conventional means.

Animal Diseases Database. To combat animal diseases, it is important to know their incidence and geographic distribution. An APHIS National Animal Health Monitoring System (NAHMS) is maintained by VS to describe animal health and management in the U.S. NAHMS collects data and compiles statistics and information from existing data bases to provide statistically sound data concerning U.S. livestock and poultry diseases and disease conditions, their costs, and associated production practices. For example, morbidity and mortality in beef feedlots and somatic cell counts in bulk milk tanks are ongoing monitoring projects. Information from NAHMS aids a broad group of users throughout agriculture and is available through the World Wide Web.

Humane Care of Animals. A number of local, State, and Federal laws deal with the humane treatment and care of animals. APHIS administers two laws that seek to ensure the humane handling of animals -- the Animal Welfare Act (AWA) and the Horse Protection Act (HPA). Appropriated funds which will be expended on enforcement of the Animal Welfare and Horse Protection Acts total \$9,536,000 for Fiscal Year 1999.

The AWA requires minimum standards of care and treatment be provided for most warm blooded animals that are bred and sold wholesale, used in biomedical research, transported in commerce, or exhibited to the public. This includes animals exhibited in zoos, circuses, and marine mammal facilities, as well as pets transported on airlines, but does not cover retail pet shops, game ranches, livestock shows, rodeos, State or county fairs, or dog and cat shows. Farm animals produced on farms and ranches for food and fiber are not covered, and those animals utilized for agricultural research are exempted. Standards of care and treatment for covered animals include the areas of housing, handling, sanitation, nutrition, water, veterinary care, and protection from the extremes of weather and temperature. Animal Care (AC) officials within APHIS enforce the AWA



through a licensing and registration system for the regulated businesses. AC inspectors conduct random unannounced inspections to ensure compliance with the standards for proper care and handling under the Act.

APHIS also enforces the Horse Protection Act, which prohibits horses subjected to a practice called "soring" from participating in exhibitions, sales, shows or auctions. In addition, the Act prohibits the transport of sored horses across State lines to compete in shows. This painful practice is used to accentuate a horse's gait and is most frequently used in Tennessee Walking Horses and high-stepping breeds. The primary enforcement tool is through inspections of horses at shows by Animal Care personnel and by "Designated Qualified Persons," who are licensed by industry organizations and certified and monitored by APHIS. They are responsible for barring horses from shows that do not meet Federal regulations under the HPA.

B. Agricultural Research Service (ARS)

The Agricultural Research Service is the primary internal research agency of the United States Department of Agriculture. ARS conducts research to develop and transfer solutions for agricultural problems, to ensure high-quality, safe food, to sustain a competitive agricultural economy, to maintain a healthy environment, and to enhance the natural resource base. The Agency performs basic, applied, and developmental research, developing agricultural products and techniques through long-term, high-risk research. This research is associated with improving crop yields, improving breeding and biotechnology techniques, development of new products, and environmentally sensitive farming techniques. ARS works closely with other USDA Agencies to develop research agendas and to provide a scientific base for program operations. The Agency has 1,800 research scientists at 102 locations. Currently, 1,200 projects are organized under 23 National Programs enabling ARS to focus research efforts on problems national in scope and critical to the Nation's food and fiber security. Animal well-being research is conducted in National Program 105, Animal Well-Being and Stress Control Systems.

Animal Well-Being and Stress Control Systems

Measures of well-being are needed to give livestock producers and consumers of livestock products the information they need to evaluate management practices and determine which techniques best assure the well-being of animals used for food production. Development of scientific measures of well-being and an enhanced ability to interpret such measures are crucial to the evaluation of current agriculture practices and development of improved alternatives. The research strategy will focus on indicators of animal well-being that can be refined and applied to the assessment of individual management conditions. Stress caused by social and environmental stressors and their interactions needs to be understood to limit negative impacts on production efficiency and well-being. Animal well-being research will benefit animals, producers, and



ultimately consumers, by reducing animal health-care costs and by improving food production efficiencies. Lack of sensitivity to animal welfare issues may be important in domestic marketing or used as an artificial trade barrier of animal products in world markets.

Scientific Measures of Well-Being. Measures of the well-being of food producing animals are needed to make scientific assessments. These measures must be scientifically sound and relevant. The measurements must integrate behavioral, physiological, and productivity parameters of economic importance

Adaptation and Adaptedness. Most food and fiber animals have been domesticated for thousands of years. However, selection under intensive management conditions has occurred only recently and is oriented primarily toward the improvement of production traits. Research in this area will reveal the roles that genetics and environment play in well-being. Research information on adaptedness will serve as the basis for modifying management practices. Genetic research will be evaluated to improve animal fitness and determine the basis of adaptation to environmental stressors, such as heat and cold. Marker assisted selection techniques will be explored.

Social Behavior and Spacing. With the intensification of animal agriculture and a greater number of animals at each location or in production units, a major question is whether the intensive management adversely affects an animals well-being. Research will be conducted to provide a scientific basis for understanding the social behavior of food animals and how the quality and quantity of space influences behavior. In order to show the consequences of changes in patterns of social interaction and space utilization, an integrated research approach will be needed.

Cognition and Motivation. The mental state, fear, frustration, suffering, pleasure, and boredom of animals are major concerns of the public, however, there is currently little scientific information that can be used as a basis for addressing these concerns. Research is needed to learn how sensory information from the environment is perceived and processed by animals and what animals learn.

Evaluate Practices and Systems to Improve Well-Being. Management practices such as transportation and slaughter and special agricultural practices such as beak trimming, dehorning, branding, tail docking, and castration are considered important and necessary elements of animal management in current production systems. These practices are known to affect the well-being of animals. Research will address evaluation of the current practices and alternative practices concerning potential pain, stress or discomfort, and production efficiency. Alternative environment systems and current management practices will be evaluated for their effect on farm animal well-being and overall goals to improve animal comfort, well-being, and production efficiency. Research to improve both production efficiency and animal well-being will be conducted.

Bioenergetic Criteria for Environmental Management. Adverse environmental conditions cause livestock and poultry losses, decreased production efficiency, and decreased animal well-being. Available technology needs to be adapted for proactively managing environmental stressors. Research to develop decision support tools is needed to help producers deal with environmental stressors, provide protective measures, recognize livestock and poultry in distress, and take appropriate management actions.

Projected Outcomes/Impacts of Program Over Next 5 Years:

- New methods will be developed to provide the scientific basis to evaluate the well-being of farm animals. These measures will be used for identifying improved production systems.
- New knowledge will be available on the interactive mechanism of the immune system and growth in relation to well-being and production efficiency.
- Research will be completed to genetically select for increased productive life of dairy cattle. An evaluation will be completed on whether implementation of a national genetic evaluation program for productive life of dairy cattle will result in an increased longevity of cows in the herd.
- New knowledge will be developed in the area of alternative techniques to decrease animal stressors in traditional management systems.
- Alternative management practices/modifications will be demonstrated that reduce stress and increase production efficiency.

National Program Components and Locations. Research under this program is ongoing at West Lafayette, IN, Mississippi State, MS, Columbia, MO, Clay Center, NE and Lubbock, TX, each with unique problems calling for unique research approaches and solutions. Managing these research projects to ensure complementarity and coordination are the key roles of the National Program Staff.

In 1994, the National Agricultural Library became part of the Agricultural Research Service. The Animal Welfare Information Center is one of ten information centers in the NAL

C. Animal Welfare Information Center (AWIC)/ National Agricultural Library (NAL)

The NAL is administratively a part of ARS and provides information and other services through traditional library functions and through electronic dissemination. It is one of four national libraries of the U.S. (others include the Library of Congress, The National Library of Medicine, and the National Library of Education) and has the largest collection of agricultural publications in the world. The collection is international in scope and dates back through hundreds of years. About 200 people work at NAL including librarians, computer specialists, information specialists, administrators, and clerical personnel. NAL maintains an Animal Welfare Information Center (AWIC), which serves

as a focal point for scientists and the public to obtain information on publications related to animal welfare/well-being issues.

The establishment of an information service on animal welfare at the National Agricultural Library was mandated by Congress in the 1985 amendments to the Animal Welfare Act (P.L. 99-198). The congressional mandate was for NAL to provide information to the regulated community (primarily researchers in the biomedical and life sciences) on: alternatives to painful procedures, anesthetics and analgesics, improved research methodologies, avoidance of unintended duplication of research, exercise for dogs, environmental enrichment for non-human primates, and training materials for scientists utilizing species covered by the Act. NAL's response to the 1985 congressional mandate was to establish the Animal Welfare Information Center.

AWIC has evolved into a multi-dimensional program that is very responsive to the regulated community's information needs. The primary activities are comprehensive literature searches for researchers, the development and distribution of topical resource guides, a quarterly newsletter, and other miscellaneous topical publications. AWIC also conducts workshops on attaining compliance with the information requirements of the Animal Welfare Act. Equally important activities include collaborations with national and international scientific organizations, presentations and exhibitions at scientific conferences, and the development of Memoranda of Understanding with agencies of foreign governments that provide national oversight of animal related activities.

These collaborations led AWIC to develop a variety of unique materials including a CD-ROM containing important Federal documents. AWIC staff also participate on various committees both inside and outside of the Federal Government. The AWIC website offers a convenient point of access to all AWIC animal welfare/well-being publications, relevant Government laws and regulations, databases, and collaborators. In the past, a grants program has supported the publication of videotapes, conference proceedings, and technical manuals, and scientific conferences.

The subject areas covered by AWIC programs and collaborations are structured to be within the mandate of Congress. Since only farm animals used in biomedical or life sciences research studies are covered by the Animal Welfare Act, the emphasis placed on farm animal species is rather limited. The vast majority of AWIC users are scientific researchers, institutional administrators, government officials (both U.S. and international), and non-profit animal-related organizations. The program has been very successful, and at least three other countries are developing similar centers using AWIC as a model.

D. Cooperative State Research, Education and Extension Service (CSREES):

The CSREES Agency coordinates an external nationwide Land Grant University System for planning and conducting agricultural research, extension and education programs among these institutions and other public and private entities. The mission of CSREES is to achieve significant and equitable improvements in domestic and global economic, environmental, and social conditions by advancing creative and integrated research, education, and extension programs in food, agricultural, and related sciences in partnership with both the public and private sectors. National goals of the Agency's programmatic activities include agricultural competitiveness, a safe and secure food system, a healthy well-fed population, protection of natural resources and the environment, and enhanced economic opportunity and quality of life.

The University and College Partners of CSREES are located nationwide and include over 130 colleges of agriculture, 59 agricultural experiment stations with over 9,500 research scientists, 57 cooperative extension services, 63 schools of forestry, 16 historically black institutions, 27 colleges of veterinary medicine, 42 colleges of family and consumer services, 29 Native American institutions, and 182 Hispanic-Serving institutions. Programs within these institutions are supported with formula funds for research and extension base programs, competitive grants for basic research studies, special non-competitive research grants, competitive and formula funding for extension initiatives, and competitive education grants. Increased funding emphasis is being placed on multi-disciplinary, multi-functional, and multi-State (regional) program activities. Research and extension programs pertaining to animal agriculture are conducted throughout this national system, and significant studies on farm animal well-being are an integral part of the national research portfolio.

Animal welfare organizations have expressed concerns about the potential for farm animal distress and pain during experimentation on food and fiber production for many years. More recently, the well-being of farm animals used to produce food and fiber for human consumption is becoming an issue. Modern intensive farm animal production systems are being challenged as stressful and detrimental to the well-being of individual animals. In addition, new production technologies emerging from animal biotechnology are likewise receiving scrutiny by animal advocacy groups in relation to animal well-being.

Scientists and animal producers are hampered in their concerns about the welfare of animals under their stewardship because well-being is exceedingly difficult to measure accurately. Production data such as growth, reproduction, feed conversion, morbidity and mortality reflect animal well-being, but are imprecise scientific indicators. Physiological, behavioral, immunological, and neurobiological measures of stress represent more rigorous biological indicators of animal well-being, but such measures are often difficult to quantify and interpret precisely or to monitor over the long

periods. Better measures of animal well-being would aid in the development and adoption of agricultural production methods for food and fiber that contribute to both production efficiency and animal well-being. Fortunately, researchers have sufficient scientific understanding of and techniques for the study of animal biology to strengthen our knowledge of well-being. Current research sponsored by CSREES is often directed toward determining more suitable measures of farm animal well being.

While farm animal well-being is a researchable area, effective research programs must include targeted studies to address specific animal well-being issues of the individual farm animal species, often in defined production systems. Each species has its own biological characteristics and its own specific environmental and social needs. CSREES sponsors research focused on well-being that spans all of the major farm animal species. These studies relate to animal care and management; housing and environmental requirements; behavior, handling and transport; stress reduction; and disease prevention and control. The CSREES funding being used in fiscal year 1999 to sponsor farm animal well-being research is estimated to be \$ 1,130,000, and includes 79 percent from formula funds, 20 percent from NRI competitive grants, and one percent from special grants. These Federal funds are leveraged several fold from other funding sources by the universities conducting the studies. The participating institutions are distributed throughout the United States. The Agency also supports extension and education programs within the system that result in the application of existing or improved practices and new technologies related to animal well-being and that enhance public understanding of farm animal production practices.

The broad strategic goals of future CSREES research and extension/education programs pertaining to farm animal well-being include:

- the enhancement of our knowledge of the biology of stress and the identification of the social and behavioral needs of farm animals including spacing,
- the development of accurate and acceptable overall measures of animal welfare, encompassing physiological and behavioral parameters,
- the use of efficacious measures of farm animal well-being to evaluate current environmental/management systems and husbandry practices, and
- the development of economically viable production systems that promote animal well-being and health.

E. Food Safety and Inspection Service (FSIS):

The primary mission of the Food Safety and Inspection Service involves serving as the public health agency in USDA responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged, as required by the Federal Meat Inspection Act, the Poultry Products

Inspection Act, and the Egg Products Inspection Act. A major aspect of this mission is to protect the public from food-borne illnesses.

FSIS regulates all raw beef, pork, lamb, chicken, and turkey, as well as approximately 250,000 different processed meat and poultry products, including hams, sausage, soups, stews, pizzas, and frozen dinners (any product that contains 2% or more cooked poultry or 3% or more raw meat). These products are packaged with 500,000 different USDA approved labels.

Humane Slaughter. The FSIS Agency is responsible for and develops and enforces regulations of the Humane Slaughter Act. Current regulations under the Act cover the handling of livestock at slaughter facilities; the condition of pens, driveways, ramps and stunning areas within the slaughtering facility; and the actual handling methods during slaughter. In 1998, FSIS issued a new Directive 6900.1, Revision 1, clarifying the inspectors' responsibilities and duties on transit vehicles from the time of arrival at official establishments until slaughter. It informs inspection personnel of the new policy permitting them to conduct antemortem inspections on vehicles, if disabled livestock cannot be humanely removed from the vehicle.

Inspection Programs. Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, FSIS inspects all meat and poultry sold in interstate and foreign commerce, including imported products. Approximately 7,400 Federal inspectors carry out inspection laws in some 6,200 plants. Approximately 1,031 livestock and 456 poultry plants conduct slaughter activities. Inspectors check animals before and after slaughter, visually examining over 6 billion poultry carcasses and 125 million livestock carcasses, including beef, pork, and lamb, each year. They prevent diseased animals from entering the food supply and examine carcasses for visible defects that can affect safety and quality. FSIS also inspects products during processing, handling, and packaging to ensure that they are safe and truthfully labeled.

FSIS inspectors can test for the presence of pathogenic microorganisms and violative drug and chemical residues. The Agency operates three field laboratories to provide analytical support. FSIS sets standards for a range of activities associated with the production of meat and poultry products. For instance, the Agency evaluates and sets standards for food ingredients, additives, and compounds used to prepare and package meat and poultry products. The Agency sets labeling standards and approves labels for meat and poultry products. Standards are also set for certain slaughter and processing activities, such as plant sanitation and thermal processing. The Agency evaluates the effectiveness of its programs through systematic and special reviews. It also responds to microbiological, residue, and other contamination incidents and, when appropriate, seeks voluntary recall of products by firms.

Food Safety. Food-borne illness is recognized as a significant public health problem in the United States. FSIS is pursuing a broad and long-term science-based strategy to improve the safety of meat and poultry products and to better protect public health. FSIS is undertaking a farm-to-table approach by taking steps to improve the safety of meat and poultry at each step in the food production, processing, distribution, and marketing chain. These steps are designed to focus more attention on the risk of microbial contamination, the Nation's most significant food safety problem. The Agency's goal is to reduce contamination as much as possible by setting public health-oriented standards for pathogenic microorganisms, building the principle of prevention into the production and inspection processes, and fostering the development and use of new technology.

In 1996, FSIS issued its rule on Pathogen Reduction: Hazard Analysis and Critical Control Point (HACCP) Systems. This new science-based HACCP system is designed to improve food safety and encompasses the following four major components:

- implementation of HACCP systems for preventing and controlling contamination,
- establishment by FSIS of testing and other monitoring activities to ensure regulatory standards are met,
- FSIS training of inspectors for proper oversight to ensure that regulatory standards are achieved, and
- reorganization of FSIS to strengthen enforcement in plants that do not meet regulatory standards.

Animal Production Food Safety Program (APFSP). In FSIS, the APFSP has the responsibility for concentrating on the link between animal production and slaughter and processing operations. As the slaughter/processing segment of the food production industry strives to meet specified targets for food safety, they, may in turn, need assurances on production practices used for animals presented for slaughter. The APFSP staff works with producers, researchers and other stakeholders to identify scientifically based practices to reduce potential chemical, physical and microbial public health risks. This program is responsible for outreach and liaison to create and sustain risk reduction strategies in the raising of live animals intended for human consumption. The program's staff includes senior staff officers with backgrounds in poultry and livestock veterinary medicine and animal sciences.

Codex Activities. Codex is the major international mechanism for encouraging fair international trade in food while promoting the health and economic interests of consumers. Within the United States, Codex activities are coordinated by officials from the U.S. Department of Agriculture, the U.S. Food and Drug Administration, and the U.S. Environmental Protection Agency. A U.S. Codex Office is located in the Food Safety and Inspection Service at USDA and provides on-line information concerning the Codex Alimentarius Commission, including its international and U.S. activities.

F. Grain Inspection, Packers and Stockyards Administration (GIPSA)

The Packers and Stockyards (P&S) Programs of the U.S. Department of Agriculture's Grain Inspection, Packers and Stockyards Administration (GIPSA) are charged with the responsibility of administering the Packers and Stockyards (P&S) Act. The work of P&S can be described as being economic fair trade regulation, as contrasted to health, safety, or service-oriented functions, which are carried out by other USDA agencies. The Act provides for regulation of the movement of livestock through stockyards. These provisions include authority to regulate the care and handling of livestock at stockyards to the extent necessary to protect the quality and value of animals.

The purpose of the P&S Act as stated by Congress is "to assure fair competition and fair trade practices, to safeguard farmers and ranchers...to protect consumers...and to protect members of the livestock, meat, and poultry industries from unfair, deceptive, unjustly discriminatory and monopolistic practices...". Employees include investigators -- auditors, marketing specialists, packer-poultry specialists, industrial specialists, and economists. The headquarters office is located in Washington, D.C., and regional offices are located in Atlanta, GA, Denver, CO, and Des Moines, IA.

The regulated industries covered by the P&S Act are rather broad. Those engaged in the business of marketing livestock, meat, and poultry in commerce are subject to the Act including stockyards, commission firms, livestock auctions, order buyers, dealers, meat packers, meat brokers, meat wholesalers, and distributors, and live poultry dealers. Regarding exclusions, farmers and ranchers are not subject to the P&S Act when buying livestock for their own stocking or feeding purposes, or when marketing their own livestock.

III. Existing Authorities for Farm Animal Regulation by USDA

The existing authorities for the regulation of farm animals define the nature and activity of the above described USDA programs pertaining to regulation. The four Congressional Acts, as amended and annotated below, determine the present scope of USDA regulatory programs. Neither of these Acts pertain to farm animal welfare/well-being on farms and ranches during commercial animal production for food and fiber.

A. Animal Welfare Act

This Act (PL 89-544;1966 as amended PL 91-579;1970 as amended PL 94-279;1976 as amended) was enacted to insure animals produced, transported and used for research or exhibition or pets are provided humane care and treatment. Animals are defined as live or dead dogs, cats, monkeys, guinea pigs, hamsters, rabbits, or other warm-blooded animals. Farm animals used in agricultural research related to food and

fiber production and poultry were specifically excluded from the original Act. Thus, farm animals used in non-agricultural research or on exhibition can be regulated; but the Act does not include the regulation of farm animals in agricultural research or in commercial food production. The USDA regulatory programs under the Animal Welfare Act are administered by the Animal Care Division of APHIS.

B. Horse Protection Act

This Act (PL 91-540; 1970 as amended PL 93-360; 1976) was enacted to prohibit horses subjected to a practice called soring from participating in exhibitions, sales, shows or auctions. The Act also prohibits the hauling of sored horses across State lines to compete in shows. Soring is defined as any burn, cut, or laceration inflicted on or any tack, nail, device or chemical injected or applied to the limb of a horse to induce discomfort and alter the action and performance of the horse when walking, trotting or otherwise moving. The soring of horses is deemed cruel and inhumane and is subject to regulation by the Secretary of Agriculture, who can impose criminal or civil charges on violators. The Animal Care Division of APHIS oversees the Designated Qualified Person programs certified by USDA to enforce the Act.

C. Humane Slaughter Act

This Act (PL 85-765; 1958 as amended PL 95-445, 1978) established “ the use of humane methods of slaughter of livestock as a policy of the United States”. The 1958 Act specifically cites humane slaughtering and handling of cattle, calves, horses, mules, sheep, swine, and other livestock; the 1978 amendment cites cattle, sheep, swine, goats, horses, mules and other equines. The 1958 Act also allows ritual slaughter to protect freedom of religion; gives regulatory authority to the Secretary of Agriculture to conduct research/investigations on slaughter/handling methods, to designate slaughter/handling methods, and to identify carcasses inspected and passed under the Meat Inspection Act, and it established an Advisory Committee. The 1978 amendment allows the Secretary to refuse or suspend inspections at facilities not using approved slaughter methods, and denies the import of meat products unless slaughtered and handled in accordance with the 1958 Act. The USDA regulatory programs under the Humane Slaughter Act are administered by FSIS.

D. Packers and Stockyards Act

This Act is rather lengthy, and Title III Stockyards is the relevant portion to animal commerce within stockyard facilities. The Act designates the Secretary of Agriculture to establish regulations under the provisions of the Title. A stockyard is defined as “a public market for livestock producers, feeders, market agencies, and buyers, consisting of pens, or other inclosures, and their appurtenances in which live cattle, sheep, swine, horses, mules, or goats are received, held, or kept for sale or shipment in commerce.”

Under the provisions of the Packers and Stockyards (P&S) Act, GIPSA has jurisdiction over the marketing of livestock at stockyards. The P&S Act requires stockyard services to be reasonable and non-discriminatory and prohibits unfair, unjustly discriminatory, or deceptive practices in connection with the receiving, marketing, buying or selling, feeding, watering, holding, delivery, shipment, weighing, or handling of livestock. These provisions provide authority to regulate the care and handling of livestock at stockyards to the extent necessary to protect the quality and value of the animals. While the focus of the P&S Act is on protecting the financial interests of livestock sellers, good animal care and handling practices are necessary to protect the quality and value of the animals and are consistent with the seller's financial interest. However, no direct references are made to humane handling.

GIPSA has proposed guidelines on the care and handling of livestock at stockyards. However, since the proposed guidelines were published in the *Federal Register*, the Department's Judicial Officer issued a decision in an administrative complaint in which the Agency alleged that a stockyard failed to provide reasonable services and care for a disabled cow in violation of the P&S Act. The Judicial Officer ruled that GIPSA did not have authority to regulate these activities without evidence that the conduct toward the animal was an unfair or unreasonable practice that resulted in harm to a person or entity the P&S Act was designed to protect. Showing harm to the animal or suffering by the animal is not enough to constitute a violation of the statute. The USDA regulatory programs under the Packers and Stockyards Act are administered by GIPSA.

E. Slaughter Horse Proposed Rules

As part of the 1996 Farm Bill (7 U.S.C. 1901), Sections 901-905 authorize the Secretary of Agriculture, subject to the availability of appropriations, to issue guidelines for the regulation of the commercial transportation of equines for slaughter by persons regularly engaged in that activity within the United States. Proposed regulations (Docket No. 98-071-1, Vol. 64, No. 96) were published in the *Federal Register* on May 19, 1999, with a period for public comment until July 19, 1999. This proposal, developed by Veterinary Services, APHIS, includes requirements for the food, water, and rest provided to such equines in transit; the segregation of stallions from the other equines during transit; and review of other related issues considered appropriate. In addition, the proposed regulations would prohibit the commercial transportation to slaughtering facilities of equines considered to be unfit for travel; the use of electric prods on equines in commercial transportation to slaughter; and, after 5 years, the use of double-deck trailers for commercial transportation of equines to slaughtering facilities.

IV. Industry and USDA Initiatives in Farm Animal Well-Being

In the past, the USDA Farm Animal Well-Being Task Group has met with various livestock commodity/industry organizations, and they have presented their programs and activities related to animal well-being. Most of these organizations have substantial on-going efforts to develop operating guidelines or standards for the humane production, transport and slaughter of farm animals.

To date, the swine, sheep and dairy industries have developed the most in-depth guidelines for producers to foster animal well-being in a production setting. The Livestock Conservation Institute has developed guidelines for the transport of livestock. The American Meat Institute (AMI) has guidelines pertaining to animal well-being in the slaughter of farm animals, and these guidelines have undergone a recent revision and are in the process of being implemented. AMI is consulting with Dr. Grandin to incorporate her recommended “critical criteria” in their standards for the evaluation of animal well-being, when handling farm animals during pre-slaughter and slaughter. AMI also obtained input from FSIS regarding the appropriateness of proposed revisions of their guidelines.

The USDA approach to resolving farm animal well-being issues is to work closely with these commodity/industry organizations in their development of guidelines or standards and to encourage guidelines that are scientifically sound, appropriate to the species, meaningful to the public as well as users, and economically feasible for viable animal industries. The USDA can contribute to the process by linking industry organizations with scientific experts in universities and Federal Agencies to aid in drafting guidelines and to serve as reviewers and evaluators of industry guidelines. The Department can also promote and support basic and applied research and various educational programs to fill knowledge gaps crucial to the establishment of appropriate industry guidelines. Finally, USDA will work in partnership with the animal industries and other interested persons to achieve complementarity between industry guidelines/standards for its self-governing programs and the congressionally mandated USDA regulatory programs.

V. Recommendations for Addressing Specific Issues Related to the “Survey of Stunning and Handling in Federally Inspected Beef, Veal, Pork, and Sheep Slaughter Plants” conducted by Dr. Temple Grandin

A. Support the Development of Appropriate Training Programs for Slaughter Plant Personnel

Clearly, a majority of the animal handling deficiencies in the Grandin Report resulted from the improper actions of people. Most of these problem areas are already covered in FSIS regulations. Proper training, supervision and oversight of slaughter personnel

are key to solving many of the animal handling deficiencies cited. More education of slaughter personnel and FSIS personnel is needed on proper animal handling and on evaluating animal well-being using Dr. Grandin's criteria.

The USDA will contribute to a resolution of the deficiencies cited in the Grandin Report by undertaking several training activities. First, slaughter plants are being encouraged to adopt the revised AMI guidelines and to implement Dr. Grandin's criteria and other effective performance criteria in their standard operating procedures. Second, FSIS is working with industry to produce a video and other educational materials on Dr. Grandin's animal well-being evaluation methods for the training of slaughter personnel. Third, FSIS personnel will be trained on how to apply Dr. Grandin's objective criteria on monitoring animal well-being during slaughter.

Currently, FSIS has conducted a national survey applying Dr. Grandin's criteria and has validated their use. Training videos and materials are in development with Dr. Grandin and will be available for FSIS and others to use. FSIS is incorporating Dr. Grandin's criteria into training programs and is presently working on these four initiatives: 1) increasing emphasis on oversight responsibilities for humane handling and stunning practices; 2) clarifying humane handling guidelines and antemortem inspection responsibilities and duties on transit vehicles, including inspector responsibility for disabled livestock, worker safety during antemortem inspection -- FSIS Directive 6900.1, Revision 1 -- and humane euthanasia; 3) evaluating the potential intersection of public health and animal welfare with respect to disabled livestock presented for slaughter, including worker safety concerns; and 4) facilitate on-going discussions and activities encouraging industry to voluntarily implement objective criteria in good management practices (GMPs) for humane handling and stunning of livestock at slaughter facilities. The Agency will continue to work with commodity groups and other USDA agencies to enhance implementation of pre-slaughter care and management programs reducing the likelihood of diseased and disabled livestock from entering the food chain.

B. Support the Adoption and Implementation of Industry Guidelines/Standards with Self-Regulation by the Industry

The meeting with the industry/commodity groups, in which they presented their programmatic activities related to animal welfare/well-being, provides an excellent beginning for future joint activities. It is hoped that industry/commodity organizations will continue to achieve the development of comprehensive guidelines/standards related to animal well-being, as suggested under section IV. USDA will encourage and support the implementation of self-governing programs by industry that currently exist or are developed with industry certifications and assurances on animal well-being. Such an approach by industry would be especially useful in addressing farm animal well-being issues on the farm, during transport, and during the handling of animals at slaughter.

Industry guidelines should be scientifically sound and technically feasible to be efficacious. Dr. Grandin's report is an example of useful information for such standards and guidelines. If industry standards are to be successful, they will need to be adopted and implemented at all levels using self-regulating procedures established by industry. This means that industry must develop their auditing system for verifying "good animal handling practices" and for assuring that industry guidelines/standards are being met. Such a self-governing industry auditing system would require systematic monitoring, record-keeping, and periodic screening for compliance by industry.

C. Proper Maintenance and Use of Electric Prods

The use of electric prods at slaughter facilities is a major concern of animal protection groups. The Grandin Report suggested three primary problems with electric prods -- over use, excessive voltage and maintenance. Proper prod selection, routine maintenance and judicious use would rectify these problems. Expectations could be further clarified utilizing Dr. Grandin's recommendations, which include periodic checks conducted by plant and FSIS personnel on the condition and voltage of electric prods. USDA will encourage the use of private consultants and university scientists at plants to solve difficulties in moving animals related to plant design and distracting/obstructing environments.

D. General Animal Handling, Stunning and Equipment Deficiencies

Various animal handling and equipment deficiencies were cited in the Grandin Report, including stun guns in poor repair, improper use of restraint devices, overcrowding and improper stunning. Education, training and supervision of slaughter personnel is crucial to improving competence in these problem areas.

USDA supports adoption of Dr. Grandin's objective criteria and equipment guidelines, and recommends that industry provide training on the maintenance and proper use of equipment.

E. Use of a Performance Standard Approach for Evaluating Animal Well-Being during Slaughter

Industry is clearly responsible for ensuring humane slaughter. Government's role is to provide oversight and to enforce existing regulations. Industry should adopt preventative systems with measurable criteria for humane handling, train its personnel in these good management practices (GMPs), provide humane supervision or implementation/audit teams, and keep records of its performance at these critical objective criteria points. Government's role would be to audit the system, test if the

criteria are met, and enforce systems failures through appropriate regulatory authorities. Dr. Grandin's report provides appropriate recommendations for this type of preventative approach with critical criteria points for humane handling and slaughter.

F. Prevention of Animal Slippage during Moving and Handling

Proper floor surfaces or gratings are required to provide adequate footing during animal movements and to eliminate slippage during handling in slaughter facilities. Thus, while the management and handling of animals may contribute to slippage problems, most of the problems would be solved by installing non-slip floor surfaces. Many floor surfacing alternatives are available, as well as advisement from professional consultants and university scientists/engineers.

USDA agrees with Dr. Grandin that industry must monitor and correct these deficiencies on a regular basis. FSIS oversight and enforcement will focus on slipping in the stunning area as a critical criteria point.

G. Transport and Slaughter of Non-Ambulatory (Downer) Animals

For animal transport, USDA only has authority under the Animal Welfare Act regarding farm animals used in non-agricultural research or for exhibition. The recent Horse Transportation Act also mandates USDA regulation of horse transport for slaughter, but does not include other species. Under the Humane Slaughter Act, USDA jurisdiction begins when the animals arrive at the slaughter facilities. Various States may have authority to regulate transport under anti-cruelty laws, but this probably varies widely across States.

Trade associations have developed transportation standards. For example, the International Air Transport Association has detailed guidelines for transporting live animals by air including requirement for feeding, watering, containers, and labeling. Likewise, the Livestock Conservation Institute provides guidance on the transport of several farm species. Various studies have been made of animal transport, but only recently have studies attempted to assess the effect of transport on animal well-being. Very limited research information is available on "downer" animals.

In concert with the policy of industry self-regulation, USDA concludes that industry must implement guidelines to seek a resolution of this problem. For example, the National Pork Producers Council adopted a policy in 1991 on the handling of downer swine in 1991 to promote humane treatment. USDA encourages on-farm evaluations by practicing veterinarians, and the euthanasia of "downer" animals that in their judgment are unsuitable for humane transport and slaughter. USDA supports Dr. Grandin's recommendations to conduct antemortem examinations on "downer"

animals on transport vehicles and stun them before removal from transport vehicles, as appropriate. USDA also supports the APHIS task of promulgating regulations on the transport of horses for slaughter. Additionally, USDA will be responsive to requests for assistance by States that wish to develop and adopt State legislation that contain laws controlling or prohibiting disabled animals at local markets.

VI. Additional Opportunities for USDA Programs/Activities with the Animal Industries and other Stakeholders on Contemporary Farm Animal Well-Being/Welfare Issues

A. Development and Sponsorship of National Forums on Farm Animal Well-Being

Various USDA agencies have supported, sponsored and organized conferences and workshops that were related to farm animal well-being. Two recent workshops were sponsored by CSREES that related to the implementation of the revised "Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching." A symposium organized by APHIS and NAL/AWIC was held in 1966 commemorating the Animal Welfare Act. The Animal Welfare Information Center has workshops annually on how to obtain information on animal well-being. CSREES and ARS have helped sponsor international conferences on farm animal behavior and well-being. A CSREES scientist has participated with university scientists in organizing and conducting a conference on facilities/equipment design as it relates to farm animal well-being.

The Food Animal Well-Being Conference sponsored by USDA and Purdue University in 1993 attempted to bring together all stakeholders to address animal well-being issues. This conference could be used as a model for future national meetings on contemporary issues related to farm animal well-being. For example, the dialogue that has been initiated between the USDA Farm Animal Well-Being Task Group, commodity/industry organizations and other stakeholders could be expanded to include a jointly sponsored conference/workshop on developing effective industry and USDA programs related to farm animal welfare. The meeting with the commodity groups in 1996 in which they presented their programmatic activities related to animal welfare/well-being provides an excellent beginning for future joint activities. Their program materials shared with USDA have been added to the collections of the Animal Welfare Information Center of NAL. Similarly, the coalition, Animal Rights International, has met with members of the USDA Task Group periodically and presented information on current farm animal welfare issues and on the viewpoints of animal protection organizations.

USDA initiatives could include collaborating with stakeholders in the development of periodic national forums on farm animal well-being to address issues of national

importance; sponsoring the development of fact sheets by university scientists that identify farm animal well-being issues; summarizing the current science based knowledge of these issues; and working with industry to implement farm animal well-being guidelines.

A beginning for such activities within USDA has been initiated with the publication in September of 1997 of an "Animal Welfare Compendium" through the efforts of CSREES scientists and AWIC/NAL. This Compendium is a collection of 14 discussion papers by invited scientists related to issues concerning the well-being of food and fiber animals in the agricultural production setting.

Regarding farm animal well-being issues during research, the Federation of Animal Science Societies (FASS) just published a revised edition of the "Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching." CSREES along with FASS sponsored the development of the new edition which was written by panels of scientists from universities, Federal laboratories and industry.

Enlarge the Mission of Animal Welfare Information Center (AWIC) in National Agricultural Library (NAL) to include a full Coverage of Farm Animal Well-Being

The Animal Welfare Information Center in the National Agricultural Library originated from a congressional mandate in the Animal Welfare Act. Its purpose was to serve as a repository for and resource on animal welfare information pertaining to animal species used in research and covered by the Act. Thus, the focus in AWIC has always been on laboratory animal species being utilized in biomedical and life sciences research; information on farm animal species is outside of the Center's congressional mandate. However, AWIC has attempted to develop these resources, albeit a modest effort without additional funding.

USDA supports a mission of AWIC to include a comprehensive collection of information on the well-being of farm animals related to agricultural research and education and to commercial production and processing environments (additional resources will be needed). Thus, AWIC would develop a more complete inventory of informational resources on farm animal well-being issues and would disseminate these materials upon request.

B. Research Needs, Priorities and Programs on Farm Animal Well-Being

Several agencies within USDA sponsor and/or conduct scientific studies in subject matter areas that are directly concerned with or impact farm animal well-being. CSREES with the land-grant university system and ARS with its in-house research programs in Federal laboratories have research efforts of this nature. Considerable programmatic effort is given to identifying the highest priority research areas for

funding. A prioritization process is used by these Agencies that draws on the knowledge and expertise of scientists, science administrators, commodity/industry leaders, consumers, and other stakeholders.

Past efforts to establish national priorities have included the FAIR'95 Conference that set broad priorities for farm animal well-being research and the Purdue Conference that added specificity and detail to FAIR'95 priorities. Several efforts have been made to implement these research priorities. CSREES and land-grant university scientists and ARS scientists are cooperating in two Multi-State Research Projects (NCR-131 and W-173) with these high priority objectives. The NRI Competitive Grants Program likewise highlights the FAIR'95 priority areas in their requests for proposals. The NRI funds research programs in farm animal well-being conducted throughout the university system and federal labs. ARS research programs were also restructured according to FAIR'95 priorities.

Additional highly targeted funding for priority problems areas in farm animal well-being would be very beneficial to expanding our scientific knowledge base. A FAIR 2002 Conference was held in April 1999 to reevaluate and update existing priorities for animal research. Farm animal well-being was one of many research areas under review during the conference.

A national ARS workshop on research priorities related to farm animal well-being and stress control systems was also held in April 1999 with customers, stakeholders and research partners. The customers' and stakeholders' highest research priority was to develop scientific measures of stress and well-being derived from a coordinated interdisciplinary effort. Other priorities included evaluation of management practices within current and alternative systems to understand and manage stress for improved care and to conduct research on transportation stress in relation to food safety. Information on the workshop is accessible through the following Internet address: <http://www.nps.ars.usda.gov/programs/105s2.htm>.

USDA supports additional funding for highly targeted research studies on national problems of highest priority related to farm animal well-being. Options include supporting the further development of a few "Centers of Excellence" for animal well-being research at universities and ARS locations that will be multi-disciplinary, capable of highly targeted research, and able to respond rapidly to unanticipated needs on national public issues that require immediate special research study; and supporting research needs related to the transport, handling and slaughter of farm animals. Important applied research areas needing study include the effects of transport, handling and slaughter on animal stress, animal behavior studies to provide tools to manage animal stress, more data on downer animals, and the relationship of animal well-being to food safety.

Glossary

AMI	American Meat Institute
APHIS	Animal and Plant Health Inspection Service
ARS	Agricultural Research Service
AWIC	Animal Welfare Information Center
CAST	Council for Agricultural Science and Technology
CSREES	Cooperative State Research, Education and Extension Service
FAIR'95	Food Animal Integrated Research Conference for 1995
FAIR 2002	Food Animal Integrated Research Conference for 2002
FASS	Federation of Animal Science Societies
FSIS	Food Safety and Inspection Service
GHP	Good Handling Practices
GIPSA	Grain Inspection, Packers and Stockyards Administration
HACCP	Hazard Analysis and Critical Control Points
NAL	National Agricultural Library
NCR-131	North Central Multi-State Research Project - 131
NRI	National Research Initiative Competitive Grants Program
P&S Act	Packers and Stockyards Act
USDA	United States Department of Agriculture
W-173	Western Multi-State Research Project - 173

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